

Appl. No. 09/832,581  
Atty. Docket No. 8494  
Amdt. dated November 25, 2003  
Reply to Office Action of September 25, 2003  
Customer No. 27752

### REMARKS

Applicants thank Examiner for consideration given to the present application. Upon entry of the present amendment, Claims 9-14, 16-29, 31-35, and 37 will be pending in the present application. Claims 1-8 and 38-45 have been cancelled without prejudice. Claims 15, 30, 36, and 46-64 had previously been cancelled. No additional claims fee is believed to be due.

### Rejection Under 35 U.S.C. 103(a)

The pending claims have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 5,538,932 (herein, "Yan") in view of U.S. Patent No. 5,416,056 (herein, "Baker"), and further in view of U.S. Patent No. 5,998,328 (herein, "Dawes"): Applicants respectfully traverse this rejection.

### I. SYNOPSIS OF THE PRESENT INVENTION

Water may contain many different kinds of contaminants including, for example, particulates, harmful chemicals, and microbiological organisms, such as bacteria, parasites, protozoa and viruses. In a variety of circumstances, these contaminants must be removed before the water can be used. In 1987, the U.S. Environmental Protection Agency (EPA) introduced the "*Guide Standard and Protocol for Testing Microbiological Water Purifiers*". The EPA protocol establishes minimum requirements regarding the performance of drinking water treatment systems that are designed to reduce specific health related contaminants in public or private water supplies.

Due to these requirements and a general interest in improving the quality of potable water, there is a continuing desire to provide low cost filter materials and filters which are capable of removing bacteria and/or viruses from a fluid. Unexpectedly it has been found that carbonized and activated lignosulfonate-coated filter particles have a large amount of mesopore and/or macropore volume when carbonized and activated. It is hypothesized that the large number of mesopores and/or macropores provide more convenient adsorption sites for the pathogens, their fimbriae, and surface polymers (e.g. proteins, lipopolysaccharides, carbohydrates and polysaccharides) that constitute the outer membranes, capsids and envelopes of the pathogens. Thus, carbonized and activated lignosulfonate-coated filter particles may be used to remove microorganisms from water.

### II. THE PRIOR ART

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The Office Action rejects the pending claims over *Yan* in view of *Baker*, further in view of *Dawes*. *Yan* generally teaches a method of forming mesoporous carbonaceous material via chemical activation. The carbonaceous material is formed into pellets and is suitable for solvent and vapor capture.

*Baker* generally teaches a process for forming highly microporous activated carbonaceous material via chemical activation. The carbonaceous material formed is useful for adsorbed natural gas storage.

*Dawes* generally teaches a method for providing a continuous coating of activated carbonaceous material over a substrate. The carbonaceous material is formed from synthetic precursors. The carbonaceous material formed is useful for accommodating a wide variety of metal catalysts.

### III. THE ARGUMENT

The PTO failed to construct a prima facie case of obviousness. "During patent examination the PTO bears the initial burden of presenting a prima facie case of unpatentability. ... If the PTO fails to meet this burden, then the applicant is entitled to a patent." *In re Glaug*, 283 F.3d 1335, 1338, 62 YSOQ2d 1151, 1152-53 (Fed. Cir. 2002). To establish a prima facie case of obviousness under 35 U.S.C. §103, the PTO must meet three basic criteria. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest *all* the claim limitations. See, for example, *In re Vaack*, 947 F.2d 488 (Fed. Cir. 1991).

#### **A. SUGGESTION OR MOTIVATION TO COMBINE THE REFERENCES**

##### **1. There was no suggestion to Combine *Yan*, *Baker*, and *Dawes*.**

Applicants respectfully assert that *Yan*, *Baker*, and *Dawes* cannot be properly combined to support a rejection under 35 U.S.C. §103 because one of ordinary skill in the art would not be motivated to combine them. The mere fact that references can be combined or modified does not render the resultant combination of obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). "Most if not all inventions arise from a combination of old elements. ... Thus, every element of a claimed invention may often be found in the prior art. ... However, identification in the prior art of each individual part claimed is

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insufficient to defeat patentability of the whole claimed invention. ... Rather, to establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant." *In re Kotzab*, 217 F.3d 1369, 55 USPQ2d 1316 (Fed. Cir. 2000).

The Office Action states that the pending claims are unpatentable over *Yan* in light of *Baker* because "[i]t would have been obvious to one of ordinary skill in the art at the time the invention was made to activate the carbonaceous material of *Yan* in the manner suggested by *Baker*, in order to obtain the advantages disclosed by this secondary reference (i.e. the production of highly microporous activated carbon) for the system of the primary reference". However, *Baker*'s process yields carbons which are highly microporous<sup>1</sup>. Conversely, *Yan* is attempting to obtain carbons which are highly mesoporous, and not microporous<sup>2</sup>. Thus, because *Yan* is attempting to obtain carbons with different characteristics than *Baker*, there would be no motivation or suggestion for *Yan* to use *Baker*'s process.

Further, the Office Action states that it would have been obvious to provide the activated carbon of the modified primary reference with a support material disclosed in *Dawes*, such as glass or ceramic. However, the precursors used by *Yan* and *Baker* include natural lignocellulose materials<sup>3</sup> versus synthetic cross-linkable resins (e.g., polyvinylidene, polyvinyl chloride, polyvinyl alcohol, etc.)<sup>4</sup> disclosed by *Dawes*. Thus, because *Dawes* only teaches the use of synthetic carbon precursors, there is no suggestion that the lignocellulose-based precursors of *Yan* and *Baker* would be successful.

## **2. *Dawes* teaches away from Applicants' claimed invention.**

Applicants respectfully assert that *Dawes* cannot be used to support a rejection under 35 U.S.C. §103 because it teaches away from Applicants' claimed invention. It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983).

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<sup>1</sup> *Baker*, Col. 2, lines 50-52.

<sup>2</sup> *Yan*, Col. 3, lines 56-62.

<sup>3</sup> *Baker*, Col. 3, line 46, and *Yan*, Col. 3, line 33.

<sup>4</sup> *Dawes*, Col. 2, lines 44-48.

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Applicants' coated filter particles are used to remove microorganisms from water. To achieve such, Applicants' coating may be discontinuous<sup>5</sup>. However, *Dawes* teaches that discontinuous coatings are not durable in fluid streams (including water)<sup>6</sup>. Thus, *Dawes* teaches away from the idea of only partially coating a substrate, such that it would not be obvious for one of ordinary skill in the art to combine *Dawes* with other references in order to achieve Applicant's claimed invention.

### 3. *Yan, Baker, and Dawes* are nonanalogous art.

Applicants respectfully assert that *Yan, Baker, and Dawes* cannot be properly combined to support a rejection under 35 U.S.C. §103 because these references are not in the field of Applicants' claimed invention, nor do they speak to the problem(s) that Applicants address. "The determination that a reference is from a nonanalogous art is ...twofold. First, we decide if the reference is within the field of the inventor's endeavor. If it is not, we proceed to determine whether the reference is reasonably pertinent to the particular problem with which the inventor was involved." *In re Wood*, 599 F.2d 1032, 202 U.S.P.Q.171 (C.C.P.A. 1979).

*Yan* discloses the use of mesoporous carbon for the capture of solvents and vapors<sup>7</sup>. *Yan* largely deals with the auto industry<sup>8</sup>. *Baker* discloses the use of highly microporous carbon for the storage of natural gas<sup>9</sup>. *Dawes* discloses the use of carbon coatings on substrates for housing metal catalysts useful in chemistry<sup>10</sup>. All of these references are in the broad category of carbon-related inventions. However, unlike the Applicants' claimed invention, none of these references are in the field of water filtration. Additionally, unlike the Applicants' claimed invention, none of these references address the removal of microorganisms from water. *Baker* and *Dawes* don't even use the carbon as a filter, but rather, use the carbon as a storage vessel for fuel and catalysts, respectively.

## B. REASONABLE EXPECTATION OF SUCCESS

### 1. *Baker's* process would destroy the function of *Yan's* product.

<sup>5</sup> U.S. App. 09/832,581, page 8, lines 2-3.

<sup>6</sup> *Dawes*, Col. 3, lines 19-25 and lines 38-42.

<sup>7</sup> *Yan*, Col. 2, line 8, Col. 3, line 23.

<sup>8</sup> *Yan*, Col. 2, lines 9-13.

<sup>9</sup> *Baker*, Col. 3, lines 17-20.

<sup>10</sup> *Dawes*, Col. 2, lines 1-4.

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Applicants respectfully assert that *Yan* and *Baker* cannot be properly combined to support a rejection under 35 U.S.C. §103 because *Baker's* process would destroy *Yan's* product. If a prior art reference requires some modification in order to meet the claimed invention or requires some modification in order to be properly combined with another reference, and such modification destroys the purpose or function of the invention disclosed in the reference, one of ordinary skill in the art would not have found a reason to make the claimed modification. *See In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984).

*Baker's* process yields highly microporous carbons for storing natural gas<sup>11</sup>. *Yan* was seeking a mesoporous carbon for the capture of solvents and fuel vapors,<sup>12</sup> not microporous carbons. Microporous carbons would not capture solvents and fuel vapors as *Yan* has described.<sup>13</sup> Thus, because *Baker's* process yields highly microporous carbons, the functionality which *Yan* desires to use the carbons for would be destroyed. Thus, one of ordinary skill in the art would not have found a reason to make the modification, thus such is not obvious.

#### C. REFERENCES MUST TEACH OR SUGGEST ALL THE CLAIM LIMITATIONS.

Finally, Applicants respectfully assert that *Yan*, *Baker*, and *Dawes* cannot be properly combined to support a rejection under 35 U.S.C. §103, and thus all of Applicants' claimed limitations are not taught or suggested. For example, *Yan* fails to teach coating a substrate. *Baker* also fails to teach coating a substrate, as well as production of a mesoporous carbonaceous material. *Dawes* fails to teach the use of a lignin-containing precursor, as well as the production of a mesoporous carbonaceous material. As discussed above, there is no teaching or suggestion that these references should be combined or modified. Thus, there is no basis for supporting that all of Applicants' claimed limitations are taught.

Additionally, Applicants wish to point out that the claimed limitations in the dependent claims are not taught by the cited references and are not obvious matters of choice. Each of the dependent claims further claim a water filter for removing microorganisms from water. It should be understood that microporous, mesoporous, and macroporous carbons behave much differently (and are also obtained much differently), and the ranges within each of these groups are often

<sup>11</sup> *Baker*, Col. 2, line 494-56.

<sup>12</sup> *Yan*, Col. 3, lines 23 and 56-59.

<sup>13</sup> *Yan*, Col. 1, lines 58-60.

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important to achieving an overall goal (e.g., removal of microorganisms from water in order to satisfy EPA standards). Thus, Applicants assert that one of ordinary skill in the art would not consider their invention obvious in light of the references cited against Applicants in the September 25, 2003 Office Action.

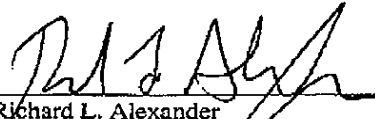
### Conclusion

In light of the above remarks, it is requested that the Examiner reconsider and withdraw the rejection under 35 U.S.C. 103(a). In view of the foregoing, Applicants respectfully request reconsideration of this application and allowance of the pending claims.

Respectfully submitted,

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